## 3.9 CULTURAL RESOURCES

Section 106 of the NHPA, as amended, requires the Commission to consider the effects of its undertakings (including issuance of certificates) on any properties that are listed in or eligible for listing in the NRHP and to afford the Advisory Council on Historic Preservation (ACHP) an opportunity to comment. As an applicant, Iroquois is gathering information necessary for us to comply with Section 106, in accordance with the ACHP's regulations at 36 CFR Part 800.

Iroquois' cultural resources consultants performed archaeological investigations after consulting with the New York and Connecticut State Historic Preservation Officers (SHPOs). In addition to the pipeline ROW, the surveys included extra temporary workspaces, one compressor station, one meter station, three mainline valves and access roads. Iroquois' consultant identified 15 archaeological sites. Of these 15 sites, the consultant recommended that 3 sites need further evaluation and may have the potential to be eligible to the NRHP. In addition, it was recommended that the Suffolk County Cemetery undergo additional investigation to determine if there are unmarked graves within the area of potential effect. The three sites and the cemetery are all located within the State of New York.

Iroquois would conduct additional surveys on the approximately 8.5 percent of the proposed corridor where access was denied. Iroquois would also continue consultation with the New York SHPO concerning further work on the three sites that were recommended for further evaluation in addition to the Suffolk County Cemetery. Potential NRHP-eligible properties identified for the onshore routes and the status of evaluation of the properties are listed in table 3.9-1.

In compliance with guidelines established by the New York and Connecticut SHPOs for similar projects, Iroquois developed a study to identify potential impacts on significant cultural resources from construction of the offshore portion of the project. Through background literature review, Iroquois' contractor identified at least 16 vessel losses within the vicinity of the Iroquois offshore corridor. This figure is estimated to be only a fraction of the actual total due to the high volume of vessel traffic and lack of early records.

Following archival search, a field survey was conducted using remote sensing. Instrumentation included a navigation system using a differential global positioning system, magnetometer, side-scan sonar, sub-bottom profiler, and depth sounder. The archaeological remote sensing survey was based on a 300 foot construction corridor to represent the area of potential effect, with survey transect spacing at 50 feet to insure overlapping coverage. An additional survey outside the 300 foot corridor was also conducted, although at 150 foot line spacing. Anchor spread survey and analysis of the results has not yet been completed and is scheduled for August 2002. The expanded survey area would measure 1,524 feet across.

Archaeological remote sensing surveys were completed for two proposed routes: Route A and Route B. In addition, Route A had two variants, and Route B had one variant. For all proposed routes and alternatives, 36 side-scan sonar targets, and 166 magnetic anomalies were recorded along the proposed corridors. The preferred route (Route A) yielded 19 side-scan sites, and 53 magnetic anomalies grouped into 27 target areas. Evaluation of all the data was conducted by a qualified marine archaeologist. It was determined that the magnetic and acoustic anomalies did not exhibit

signatures that would suggest they were cultural sites. Accordingly, no potentially eligible submerged cultural resources are known for the project area.

TABLE 3.9-1
**Potential NRHP-Eligible Properties That May Be Affected by the ELI Project**

| Site Name | Site Type/ Description | Proposed Work or Treatment a/ | SHPO Comments b/ | Status of Site Evaluation c/ |
|---|---|---|---|---|
| Suffolk County Cemetery | Historic | Remote Sensing | Needs Evaluation and SHPO consultation | Scheduled for Spring of 2002 as part of a different FERC filing. |
| Key Span 1, Locus 2 | Prehistoric | Evaluate for NRHP | Needs Evaluation and SHPO consultation | Not yet scheduled |
| Key Span 2, Locus 1 | Historic | Evaluate for NRHP | Needs Evaluation and SHPO consultation | Not yet scheduled |
| CR-2, Locus 2 | Historic | Evaluate for NRHP | Needs Evaluation and SHPO consultation | Not yet scheduled |
| Historic Structures | Architectural | Intensive Architectural Survey | Additional survey needed. New York SHPO has not yet commented. | Not yet scheduled |

a/ As recommended by consultants.
b/ SHPO comments.
c/ Results have not been filed with the Commission.

In summary, construction and operation of the proposed pipelines and associated facilities could potentially affect historic properties. Project impacts could be direct or indirect. Direct impacts could include the physical destruction or damage to all or a portion of a site, or alteration or removal of an historic property. Indirect impacts could include the introduction of visual, atmospheric, or audible elements that diminish the integrity of the site or alter settings associated with historic properties.

Both direct and indirect project impacts on historic properties can usually be mitigated to less than significant levels. Mitigation measures range from data recovery, including the scientific excavation of archaeological sites; to detailed documentation, including architectural drawings of historic buildings. Other measures can include the use of landscaping techniques to screen visual intrusions and maintain site settings. We would require Iroquois to produce treatment plans indicating how impacts on historic properties would be reduced or mitigated. We will consult with the New York and Connecticut SHPOs, the ACHP, and other parties, if appropriate, on the adequacy of these plans. After consultation, implementation of the treatment plan would occur only after the FERC issues a Certificate for the proposed project, and provides written notification to proceed.

The fieldwork to assist with compliance with Section 106 of the NHPA has not been completed for all elements of the Iroquois Pipeline Project. While the majority of the project area has been inventoried for cultural resources, there are still locations, such as where survey access has

been denied and the submerged anchor spread, that have not been surveyed, or where the SHPO has not yet commented about potential effects on historic properties. Table 3.9-2 lists the elements where studies or consultations still need to be completed.

TABLE 3.9-2
**Cultural Resources Investigations or Reviews Still Needed for the ELI Project**

| Facility | Item Not Yet Completed | Status |
|---|---|---|
| Iroquois Pipeline | Survey in portions of Suffolk County not yet conducted | Pending permission |
| Onshore segments | Additional testing of the Suffolk County Cemetery | Fieldwork will be completed by Spring-Summer 2002 |
| Onshore segments | Evaluation reports for the 3 sites that may be NRHP eligible | Not yet scheduled. |
| Onshore segments | Architectural/Historic building survey | Not yet scheduled. |
| Offshore segments | Anchor spread area survey, additional evaluations or site avoidance plans | Fieldwork will be conducted in August 2002 |

To ensure that all project components are properly studied for cultural resources, we **recommend that:**

**Iroquois should defer construction and use of the proposed project facilities together with the use of related ancillary areas for staging, storage, and temporary work areas and new or to-be-improved access roads, until:**

a. **Iroquois files with the Secretary all additional required cultural resources inventory and evaluation reports, and any necessary treatment plans;**
b. **Iroquois files the appropriate SHPO and any other appropriate parties' comments on all cultural resources requests, investigation reports, and plans;**
c. **The ACHP has been given an opportunity to comment if any historic properties would be affected; and**
d. **The Director of OEP reviews and approves all cultural resources reports and plans, and notifies Iroquois in writing that they may proceed with mitigation programs or construction.**

**All material filed with the Secretary containing location, character, and ownership information about cultural resources must have the cover and any relevant pages therein clearly labeled in bold lettering: "CONTAINS PRIVILEGED INFORMATION - DO NOT RELEASE."**

Iroquois has filed acceptable plans for unanticipated discovery of archaeological materials or human remains during construction for both New York and Connecticut that address appropriate statutes and list personnel to be notified.

### Native American Consultation

Section 101(d)(6) of the NHPA requires Federal agencies, as part of their responsibilities under Section 106, to consult with Indian tribes to identify properties of traditional religious and cultural importance which may be affected by a project. Iroquois' consultant has sent certified letters to the appropriate Native American Tribes. To date, the Native American representatives have not requested further consultation with Iroquois' cultural resource consultants, and no traditional cultural properties have been identified.

## 3.10 SOCIOECONOMICS

### 3.10.1 Region of Influence

The socioeconomic resource area has been identified as a minor concern during internal scoping. Therefore, an abbreviated analysis is presented.

The ELI Project's region of influence (ROI) involves the construction of about 17.1 miles of new offshore pipeline in Long Island Sound and 12.0 miles of new onshore pipeline in Suffolk County, New York, and other facilities as described in section 2.1. Table 3.10.1-1 summarizes selected socioeconomic statistics for the two-county project area.

TABLE 3.10.1-1
**Existing Socioeconomic Conditions in the ELI Project Area**

| State/County | Population 2000 | Density (People/ Square Mile) | Per Capita Income 1999 | Rental Vacancy Rate 1990 | Civilian Labor Force July 2001 | Unemployment Rate July 2001 | Major Industry |
|---|---|---|---|---|---|---|---|
| **CONNECTICUT** | 3,405,565[a/] | 702.9[a/] | $38,506[b/] | 6.9[c/] | 1,756,866[d/] | 3.4[d/] | Services, Retail[e/] |
| New Haven | 824,008[a/] | 1,359.7[a/] | $33,201[f/] | 7.5[c/] | 424,652[d/] | 3.9[d/] | Services, Retail[e/] |
| **NEW YORK** | 18,976,457[h/] | 401.9[h/] | $33,901[i/] | 4.9[j/] | 9,096,000[k/] | 4.5[k/] | Services, Retail[a/] |
| Suffolk | 1,419,369[h/] | 1,556.3[h/] | $33,803[i/] | 7.0[j/] | 747,300[k/] | 3.8[k/] | Services, Retail[e/] |

Sources:

| | | | | | |
|---|---|---|---|---|---|
| a/ | Census 2000a | d/ | CTDOL 2001 | i/ | NYDOL 2001a |
| b/ | BEA 1999a | e/ | BEA 1997 | j/ | Census 1990b |
| c/ | Census 1990a | f/ | BEA 1999b | k/ | NYDOL 2001b |
| | | h/ | Census 2000b | | |

### 3.10.2 Population and Housing

Construction of the ELI Project would result in a temporary increase in population within the project area. Construction personnel that would be hired from outside the project area would include construction specialists, supervisory personnel, and inspectors, accounting for approximately 50 to 70 percent of the workforce. These individuals would need to move into the project area on a temporary basis. Non-local workers would generally reside in the vicinity of the project for relatively short periods of time and, typically, few workers are accompanied by family members.

Most non-local workers are likely to use temporary housing such as hotels, motels, and apartments within commuting distance of the project area. Temporary housing is typically used because the construction period for the project is relatively short, and because most non-local workers generally would not bring family members due to the relatively short-term nature of the relocations. Construction crews would not have difficulty locating temporary housing.

### 3.10.3 Employment and Income

The project would require 400 construction workers to build the pipeline. This would generate an additional 384 jobs in other employment sectors in New Haven and Suffolk Counties. The ELI Pipeline Project would benefit the local economies of both counties by generating approximately $21.6 million in new income during the 11-month construction period. Assuming a 5.0 percent state income tax rate for this income (the State of New York income tax varies between 4.0 and 6.85 percent and the State of Connecticut rate varies between 3.0 and 4.5 percent depending on filing status, income level, etc.), it would generate approximately 1.1 million in state income tax for the 11-month construction period.

Iroquois, through its construction contractors and subcontractors, would attempt to hire local, skilled construction workers. Approximately 30 to 50 percent of the construction workers per spread and for the construction of the meter and compressor station would be local hires. The majority of inspectors would be non-local due to the specialized knowledge required for the position. Since the offshore and onshore construction would not happen concurrently, the majority of the 200 workers required for offshore construction could also work in the onshore spreads, thus filling almost all of the onshore construction jobs.

Operation of the facilities would require minimal employment onsite as the aboveground facilities are designed for remote control operation. Two employees would staff the compressor station and inspectors and maintenance crews would be employed on an as-needed basis. The minor increase in employment during the operation of the proposed facilities would not lead to any significant employment or income effects.

### Local Economy and Tax Revenues

During construction of the facilities, some portion of the direct income would be spent locally for the purchase of temporary housing, food, gasoline, entertainment, and luxury items. The amount spent in a given area would depend on the number of construction workers and the duration of their stay. Some portion of the construction materials would also be purchased locally. These expenditures would stimulate the growth of the indirect jobs detailed above. These expenditures would also generate revenue for state and county governments through the payment of sales taxes on the purchases. Approximately $825,000 in taxes could be generated from the pruchases of materials required for the pipeline and meter station construction (Iroquois 2001).

The tax revenue impacts of operating the pipeline would be more long-term. During operation, the pipeline facilities would be subject to state, county, and local property taxes. State, county, and local governments would benefit from the increased revenue and their respective annual budgets would increase. Approximately $0.95 million in tax revenues would be generated per year of operation of the pipeline and metering station.

**Community Services**

Given the relatively high population density of the project area, the socioeconomic impacts associated with incremental increases in demand for community services and facilities are not expected to be significant. Community services, such as police, fire protection, and medical facilities, would experience minor and short-term impacts. Demands for local government agency action would experience a short-term increase as permit applications are filed and permits are issued. Police, fire, medical, and government services, as well as local schools, would benefit from the increased tax revenue and expenditures resulting from the ELI Project.

During operation, Iroquois would be required by the DOT to establish and maintain communications with appropriate fire, police, and public officials. The company would institute procedures that would be followed to coordinate and respond to gas pipeline emergencies (see section 3.12, Safety and Reliability).

During scoping, one commentor acknowledged the benefit that the Devon Compressor Station would provide to the community in terms of property tax revenues while at the same time disrupting the entire community. The facility would be located in an idustrial area away from housing communities. Therefore, no disruption to the local community is expected from the construction and operation of the Devon Compressor Station.

### 3.10.4 Transportation

**Road and Rail Traffic**

Short-term impacts on the transportation network would result from construction of the pipeline across roads, movement of construction equipment and material to and from work areas, and daily commuting of the construction workforce to the work area. The impacts would not be significant, and would be limited to the construction period.

Iroquois would install the pipeline under several high-volume paved roadways and railroads using the horizontal boring method, thereby avoiding disruption of traffic flows. Low-volume roads and unpaved roads would be crossed using conventional upland construction procedures with modifications as needed. These procedures would require closing the road or driveway and posting signs identifying construction areas and detours if they exist. Pipeline installation at road crossings would typically be completed in less than 24 hours and roads would be restored to a condition similar to preconstruction immediately following installation. In some cases, a temporary bridge or bypass may be established on small roads and driveways, or one lane may be closed at a time with traffic diverted to other lanes. Road closings during peak traffic hours would be avoided to the extent possible.

To maintain safe conditions, Iroquois would require their construction contractors to comply with applicable vehicle weight and width restrictions, and to remove soil that is left on the road surface by the crossing of construction equipment. When it is necessary for equipment to move across paved roads, mats or other appropriate measures would be used to prevent damage to the road surface.

The transportation network would experience a short-term incremental increase due to the additional commute traffic from construction workers between home and work. Several construction-related trips may be made each day (to and from the job site) on each spread. This level of traffic would remain fairly constant throughout the construction period, and would typically occur at early morning hours and evening hours. Road congestion is common in Suffolk County and the additional traffic from construction workers commuting to work would not significantly alter current conditions. Pipeline construction work is generally scheduled to take maximum advantage of daylight hours so that most workers would commute to and from the sites in off-peak hours. Construction workers typically leave a number of personal vehicles at a contractor yard and share rides with other workers or are bused to the construction ROW with other workers, thereby reducing overall traffic. Furthermore, workers would be dispersed along the length of the construction spread, which tends to reduce the impact on traffic at any one location.

The movement of construction equipment and materials from contractor and pipe storage yards to the construction work area would result in an additional short-term impact on the transportation network. Truck traffic associated with transporting construction equipment and pipe to the pipeline route may increase the workload of local police due to monitoring of vehicle weight and width restrictions. Also, detours or obstructions in traffic flow due to the large vehicles or construction of pipeline road crossings may require short-term assistance from local police in limited instances. Project-related demands on local police workloads are not expected to be significant.

**Vessel Traffic**

Commercial shipping, ferry service, sightseeing tours, and recreational boating contribute to vessel traffic on the Sound. Construction of the offshore portion of the ELI Project would also generate marine vessel traffic. These vessels, when added to the existing vessel traffic, could increase competition for berth space and berthing costs and increase the potential for vessel collisions, harbor congestion, and disturbance from noise or vessel wakes. Navigation regulations and precautions would be followed so as not to impede vessel traffic during the period required for pipeline installation. Also, the large channel area of the Sound should provide adequate alternate routes for vessels.

In addition, Iroquois would coordinate with the U.S. Coast Guard. Notice to Mariners would be issued with installation details. Communication would also be ongoing with vessels in the vicinity of the installation activities. The offshore areas allow for movement from one area to another so that the commercial shipping would continue as the project installation moves across the Sound. Neither of the two local ferry routes are in the vicinity of the proposed project location and no impact on service is expected.

During scoping, one commentor raised concerns about impacts to commerce in the Sound from construction of the offshore pipeline segment. The large channel area of the Sound should provide adequate alternate routes for vessels and no impacts to commerce are expected.

### 3.10.5 Property Values and Land Issues

During scoping, a number of local residents expressed concern about the proximity of their property to the proposed route. This could be related to concerns about the potential devaluation of

their property once the property is encumbered by a pipeline easement. Appraisal methods used to estimate land values are based on objective characteristics of the property and any improvements. The impact that a pipeline or the presence of a nearby aboveground facility may have on the value of the land depends on many factors including size, existence of other pipelines, the current value of the land, its location, and current land use. A potential purchaser of a property would make a decision to purchase based on the planned use (such as agricultural, future subdivision, or home) of the property in question. If the presence of a pipeline renders the planned use infeasible, or if the presence of an aboveground facility disrupts the visual aesthetics, a potential purchaser may decide not to purchase the property. However, each potential purchaser has a different goal and ability to purchase land.

The effects that a pipeline easement may have on property values could be negotiated between the parties during the easement acquisition process. The easement acquisition process is designed to provide fair compensation to the landowner for the right to use the property for pipeline construction and operation. The easement agreement between the company and the landowner typically specifies compensation for loss of use during construction, loss of non-renewable or other resources, and allowable uses of the permanent ROW after construction.

If an easement cannot be negotiated with the landowner and the project has been certificated by the Commission, the company may use the right of eminent domain granted to it under section 7(h) of the NGA and the procedure set forth under the Federal Rules of Civil Procedure (Rule 71A) to obtain the ROW and extra workspace areas. The company would still be required to compensate the landowner for the ROW, and for any damages incurred during construction. However, the level of compensation would be determined by a court according to state law once the FERC issues a certificate. In either case, Iroquois would compensate landowners for the use of the land.

Property taxes for a parcel of land are generally based on the actual use of the land. The majority of the pipeline would follow the existing ROW to minimize impacts to land use and vegetation cover; however, impacts to these resources would still occur. These impacts are addressed in sections 3.5, Vegetation, and 3.8, Land Use. Installation of the pipeline would preclude construction of aboveground structures on the permanent ROW for the life of the project. Any landowner who feels that the presence of the pipeline easement reduces the value of their land, resulting in an overpayment of property taxes, may appeal the assessment/taxation issue to the local property tax agency.

A common concern with pipeline construction is that the presence of the pipeline would lead to further utility construction, such as pipelines and transmission lines on adjoining lands, and that the presence of the ROW could lead to the increased use of off-road vehicles along the route. These issues are addressed in section 3.8.2.2.

### 3.10.6 Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, provides that "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." In addition to considering

environmental effects, Federal agencies should identify mitigation measures that address significant and adverse environmental effects of proposed actions on minority populations, low-income populations, and Indian tribes as part of a NEPA analysis (CEQ, 1997).

Under Executive Order 12898, each Federal agency must ensure that public documents, notices, and hearings are readily available to the public. The mailing distribution list for this EIS was initiated when the NOI was first issued, and has been continuously updated during the EIS. The original mailing list included all affected property owners along the proposed route, as identified by Iroquois, without any distinction based on minority or income status. The mailing list also included Native American groups identified as having an interest in the project area.

Since 2001, Iroquois has been in contact with Federal, state, and local officials, non-governmental groups, and landowners in each county traversed by the project to solicit input on the route and provide information on the project. Open houses, public scoping meetings, and the project site visit provided property owners, municipalities, counties, special interest groups, and state and Federal regulatory agencies an opportunity to comment on the project. Section 1.3 describes the public notification process and participation process, which includes interested parties without regard to minority status.

The FERC requires that an applicant initially identify all residences within 50 feet of the construction work area. From this information, we analyze the pipeline route with respect to: (1) how close in feet the proposed ROW is to the residence, and (2) other engineering constraints that may affect constructability or the safety and welfare of residents. Special construction procedures, techniques, and/or site-specific mitigation measures are then identified to minimize impact on residences potentially affected by construction, regardless of the income or minority status of the resident. Iroquois has prepared site specific plans and proposed several mitigation measures to minimize construction impact on residential and commercial buildings located within 50 feet of the construction work area. The plans and mitigation measures are discussed in more detail in section 3.8.2.2.

The FERC has not identified any disproportionately high and adverse human health or environmental effects on minority and low-income communities or Native American groups.

# 3.11 AIR QUALITY AND NOISE

## 3.11.1 Air Quality

Air quality can be affected by facility and pipeline construction and by operation of compressor stations and related facilities. Iroquois proposes to construct about 29 miles of natural gas pipeline in New Haven County, Connecticut, and Suffolk County, New York. The pipeline construction would include about 17 miles of pipeline in Long Island Sound and about 12 miles of pipeline on Long Island. Three mainline valves and a meter station would be installed along the onshore section of the pipeline. In addition to the pipeline, Iroquois proposes to add a gas cooler to the Dover Compressor Station in Dutchess County, New York; to construct the Devon Compressor Station in the City of Milford, New Haven County, Connecticut; and to modify the Brookfield Compressor Station in the Town of Brookfield, Fairfield County, Connecticut, by adding gas filtration, metering, and various piping changes to the design which is currently in review under Docket No. CP02-31-000.

During operation, the Devon Compressor Station would emit various quantities of regulated air pollutants, including carbon monoxide (CO), nitrogen oxides ($NO_X$), volatile organic compounds (VOCs), sulfur dioxide ($SO_2$), and particulate matter. $NO_X$ emissions include a combination of nitric oxide (NO) and nitrogen dioxide ($NO_2$). The pollutants emitted in the greatest quantities would be CO and $NO_X$. Preliminary estimates indicate that all pollutant emissions from the proposed compressor station would be below Federal major source quantity thresholds.

### Regulatory Requirements

The Federal Clean Air Act (CAA) provides the basis for most Federal and state air quality management programs and regulations. The EPA has adopted National Ambient Air Quality Standards (NAAQS) for six criteria air pollutants: CO, $NO_X$, $SO_2$, ozone ($O_3$), inhalable particulate matter ($PM_{10}$), and lead. Individual states can establish additional air quality standards for criteria pollutants which are more stringent than the NAAQS, and also can establish standards for pollutants not covered by the NAAQS. The air pollutants of greatest concern in the project area are $O_3$, CO, and $PM_{10}$. $O_3$ is not emitted directly, but forms through chemical reactions in the atmosphere from emissions of VOCs and $NO_X$.

States and EPA classify areas as nonattainment (violating a NAAQS), attainment (better than a NAAQS), or unclassified. Unclassified areas are treated as attainment areas for most regulatory purposes. Areas that have been reclassified from nonattainment to attainment of Federal air quality standards are automatically considered "maintenance areas". States are required to develop and implement State Implementation Plans (SIPs) to achieve and maintain the NAAQS.

Section 176(c) of the CAA requires Federal agencies to ensure that actions undertaken in nonattainment or maintenance areas are consistent with the CAA and with the applicable SIPs. Emissions from stationary sources such as the proposed Devon Compressor Station are subject to state and Federal air quality permit program requirements. Federal preconstruction program requirements include new source review (NSR) for sources in nonattainment areas, prevention of significant deterioration (PSD) for sources in attainment areas, and new source performance

standards (NSPS) for selected categories of industrial sources. In addition to preconstruction permit reviews, facility operating permits (Title V permits under 40 CFR part 70) are required if the annual potential to emit would exceed various thresholds for criteria and hazardous air pollutants. NSR permit requirements include requirements for best available control technology (BACT) and emission offsets. PSD permit requirements include BACT requirements, evaluation of emission impacts on vegetation and soils, and dispersion modeling analyses to demonstrate that facility emissions would not cause ambient $NO_X$, $SO_2$, or $PM_{10}$ increment limits to be exceeded.

Federal NSPS emission limits have been established for stationary gas turbines in 40 CFR Part 60 Subpart GG. These regulations limit $NO_X$ emissions in the exhaust from large stationary gas turbines.

In Connecticut, the major source thresholds that would trigger Federal NSR requirements are emissions of 50 tons per year or more of either VOC or $NO_X$. The major source thresholds for Federal PSD requirements are 100 tons per year or more of attainment pollutant emissions (CO, $SO_2$, $NO_X$, or $PM_{10}$). A PSD review also would be triggered if a new source would have annual emissions above the significant emission rate (SER) thresholds of 40 tons per year for $NO_X$ and 100 tons per year for CO. Connecticut Department of Environmental Protection regulations (Section 22a-174-3 of the Regulations of the CTDEP) require BACT for all pollutants emitted in amounts greater than 5 tons per year.

#### 3.11.1.1 Affected Environment

The proposed project includes compressor station facilities in New Haven County, Connecticut plus pipeline facilities in New Haven County, Connecticut and Suffolk County, New York. Ozone, carbon monoxide, and $PM_{10}$ are the air pollutants of greatest concern in the project area. New Haven County, Connecticut is designated as a serious nonattainment area for ozone and as a maintenance area for carbon monoxide. The City of New Haven, Connecticut is a nonattainment area for $PM_{10}$. Suffolk County, New York is designated as a severe nonattainment area for ozone. The project study area is an attainment area for all other criteria pollutants.

Emission thresholds that would trigger Federal NSR and PSD review of the Devon Compressor Station are 50 tons per year for VOC emissions, 50 tons per year for $NO_X$ emissions, and 100 tons per year for other pollutants (CO, $SO_X$, and $PM_{10}$). Although federal NSR and PSD review of the compressor station is not anticipated, Connecticut Department of Environmental Protection regulations (Section 22a-174-3 of the Regulations of the CTDEP) require a state air quality permit for construction and operation of the facility.

#### 3.11.1.2 Environmental Consequences

Pipeline construction would occur over a period of about 1 year, with the offshore pipeline segments constructed first. The construction schedule for the Devon Compressor Station is not yet available, but construction would probably require less than 12 months. The construction schedule for addition of the gas cooler facility at the Dover Compressor Station is not yet available, but probably would require less than 6 months. The proposed modifications to the Brookfield Compressor Station would not significantly alter the construction schedule for that currently planned facility.

Most of the offshore pipeline construction would be done from a laybarge assisted by tugboats. Other small boats would transport work crews and various supplies. Onshore pipeline construction would require bulldozers or graders for corridor preparation; excavators or backhoes for excavation; front-end loaders for managing topsoil and spoil stockpiles; and trucks, forklifts, mobile cranes, and side-boom tractors for pipeline handling. Most ground disturbance would occur during clearing and trenching operations at the start of construction, and during backfilling operations at the end of construction. Less ground disturbance would occur during assembly, inspection, and installation of the pipeline. Construction activity at the compressor station sites would require various bulldozers, trucks, cranes, forklifts, front-end loaders, concrete mixers, and other construction equipment.

The Devon Compressor Station would have a gas turbine compressor and a back-up power generator. In addition, compressor station buildings would be equipped with space heaters and water heaters. Equipment selection has not yet been finalized, but the turbine is expected to be rated at 20,000 horsepower. The size and model for the back-up generator has not been identified at this time, but the back-up generator is expected to operate for less than 500 hours per year. Assuming continuous operation of the compressor and 500 hours per year of generator use, annual emissions from the Devon Compressor Station would be about 3.8 tons per year of VOCs, 49 tons per year of $NO_X$, 5.7 tons per year of $SO_X$, 78.1 tons per year of CO, and 4.8 tons per year of $PM_{10}$. State permit review would ensure that the Devon Compressor Station meets BACT requirements. Emission estimates for the Devon Compressor Station assume the use of dry low-$NO_X$ or lean pre-mix combustion.

To confirm the results of our preliminary analysis **we recommend that:**

**Prior to construction, Iroquois file the following information with the Commission:**

**a. the make and model number of the turbine and compressor to be installed at the Devon Compressor Station, and**

**b. the manufacturer emission estimates in tons per year for $NO_x$, CO, VOC, PM, and $SO_2$ from the selected turbine unit.**

There would be no operational emissions associated with the gas cooler facility at the Dover Compressor Station. The design changes for the Brookfield Compressor Station likewise would not cause any change in anticipated facility emissions. Consequently, the facility modifications proposed for the Dover and Brookfield Compressor Stations would not have any operational air quality impacts.

### 3.11.2 Noise

Noise conditions can be affected during construction and operation of pipeline facilities. The ambient sound level of a region is defined by the total noise generated within the specific environment, and is usually comprised of sounds emanating from natural and artificial sources. At any location, both the magnitude and frequency of environmental noise may vary considerably over the course of a day and throughout the week. This variation is caused by changes in noise source activity, changing weather conditions, and the effect of seasonal vegetative cover.

Two measurements commonly used by Federal agencies to relate the time-varying quality of environmental noise to its known effects on people are the equivalent sound level ($L_{eq}$) and the average day-night sound level ($L_{dn}$). The $L_{eq}$ is an average A-weighted sound level containing the same sound energy as the varying sound levels measured over a specific period of time. Annoyance from noise levels varies depending on the length of exposure and the time of day. The $L_{dn}$ takes into account the duration and time the noise is encountered. Late night and early morning (10:00 p.m. to 7:00 a.m.) noise exposures are penalized +10 dB to account for people's greater sensitivity to sound during the nighttime hours. Daytime noise levels (7:00 a.m. to 10:00 p.m.) are not adjusted when computing the 24-hour average $L_{dn}$ value.

In 1974, the EPA published "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety." This publication evaluates the effects of environmental noise with respect to health and safety. The document provides information for state and local governments to use in developing their own ambient noise standards. The EPA recommended that noise levels should not exceed an $L_{dn}$ of 55 decibels on the A-weighted scale (dBA), the level which protects the public from indoor and outdoor activity interference. An $L_{dn}$ of 55 dBA is equivalent to a continuous noise level of 48.6 dBA. We have adopted the EPA's $L_{dn}$ noise level standard and have used it to evaluate noise impacts.

The State of Connecticut has established noise standards that set property line noise limits based on three general land use categories (Class A for noise sensitive uses, Class B for commercial uses, and Class C for industrial uses). Daytime and nighttime noise limits are set based on the land use category for the noise source and the land use category for the area affected by the noise source. For an industrial (Class C) noise source affecting a residential (Class A) land use, the noise limits are 61 dBA during daytime hours and 51 dBA during nighttime hours. The Town of Dover, Connecticut has a noise ordinance that limits most construction activity to the hours of 7:00 a.m. to 9:00 p.m. In addition, the zoning code of the Town of Dover sets property line noise limits of 60 dBA for daytime hours (7:00 a.m. to 8:00 p.m.) and 50 dBA for nighttime hours (8:00 p.m. to 7:00 a.m.).

New York does not have any state noise standards that would apply to pipeline construction activities. The Town of Brookhaven has a noise standard (Chapter 50 of the Brookhaven Code). Noise levels due to construction activities are exempt, but the standard prohibits construction activity between the hours of 10:00 p.m. and 7:00 a.m. on weekdays, and all hours on weekends and legal holidays.

### 3.11.2.1 Affected Environment

The proposed Devon Compressor Station is located in an industrial area about 3,400 feet south of Route 15, 4,600 feet southwest of the Milford Parkway, and 6,600 feet northwest of I-95. A Penn Central Railroad track runs along the eastern property line. In order to establish existing ambient noise levels in the area, a noise monitoring study was conducted in the vicinity of the Devon Compressor Station on September 26-27, 2001. The nearest noise sensitive areas (NSAs) are 1,300 north and 1,500 feet east of the proposed compressor station site and measured $L_{dn}$ levels were 58 and 57 decibels, respectively.

A noise survey for the Dover Compressor Station was conducted on November 11-12, 1999. The closest NSA is located 800 feet south of the site, and two other NSAs are located 900 feet east and 3,500 feet west. Measured $L_{dn}$ levels were 53.5, 53.1, and 51.2 decibels, respectively.

Because the modifications proposed for the Brookfield Compressor Station would not alter the operational noise levels generated by that facility, no affected environment data is necessary.

### 3.11.2.2 Environmental Consequences

The construction schedule for the Devon Compressor Station is not yet available. The level of construction activity at the site would vary over the course of construction depending on the components being worked on at a given time. On-site construction noise levels would be expected to vary between 80 and 90 dBA about 50 feet from the primary construction activity. The closest noise-sensitive area is about 1,300 feet from the compressor station site. At that distance, construction site noise levels would be reduced to approximately 57 dBA. This noise level would be about the same as existing daytime ambient noise levels. Construction activity would be limited to daytime periods, further reducing the disturbance potential from station construction. Consequently, construction noise impacts for the Devon Compressor Station are not considered significant.

Normal compressor station designs are intended to minimize noise impacts on nearby properties. The gas turbine and compressor equipment would be housed in an acoustically treated structure, with noise silencers provided on both the exhaust stack and the air inlet. Operation of the Devon Compressor Station would produce incremental noise levels lower than the existing ambient noise levels at the closest noise sensitive areas. Table 3.11.2-1 summarizes the expected increases in noise levels near the Devon Compressor Station.

As indicated by table 3.11.2-1, operation of the Devon Compressor Station would increase noise levels at the nearest NSAs by about 1 dBA. In all cases, the incremental $L_{dn}$ level attributable to the Devon Compressor Station would be less than the FERC guideline of 55 dBA. In addition, the hourly average noise levels ($L_{eq}$) produced by the Devon Compressor Station would be less than the limit set by the state noise standards. Consequently, noise impacts from operation of the Devon Compressor Station are not considered significant.

TABLE 3.11.2-1
**Existing and Estimated Noise Levels at the Devon Compressor Station**

| NSA | Distance/ Direction | Ambient Noise level ($L_{dn}$) | Estimated Noise Addition of Station ($L_{dn}$) | Total Potential Noise Level[1] ($L_{dn}$) | Potential Noise Increase (dBA) |
|---|---|---|---|---|---|
| 1 | 1300 feet/North | 58 | 51.4 | 58.9 | 0.9 |
| 2 | 1500 feet/East | 57 | 50.4 | 57.9 | 0.9 |

Note 1: calculated

To ensure that noise emitted from the station does not exceed an $L_{dn}$ of 55 dBA we recommend that:

**Iroquois should file a noise survey with the Secretary no later than 60 days after placing the Devon Compressor Station in service. If the noise attributable to the operation of the facility at full load exceeds an $L_{dn}$ of 55 dBA at any nearby NSAs, Iroquois should install additional noise controls to meet that level within 1 year of the in-service date. Iroquois should confirm compliance with the $L_{dn}$ of 55 dBA requirement by filing a second noise survey with the Secretary no later than 60 days after it installs the additional noise controls.**

The construction schedule for addition of the gas cooler facility at the Dover Compressor Station is not yet available, but probably would require less than 6 months. The level of construction activity at the site would vary over the course of construction depending on the components being worked on at a given time. On-site construction noise levels would be expected to vary between 80 and 90 dBA about 50 feet from the primary construction activity. The closest noise-sensitive area is about 800 feet from the compressor station site. At that distance, construction site noise levels would be reduced to about 62 dBA. A school is located about 3,500 feet from the compressor station site. At that distance, construction site noise levels would be reduced to about 45 dBA. Locations within about 1,500 feet of the construction site would be exposed intermittently to noise levels 10 dBA or more above current average daytime noise levels. Locations further away would be exposed to less noticeable construction noise. Construction activity would be limited to daytime periods, reducing the disturbance potential from station construction. Consequently, construction noise impacts for modifications to the Dover Compressor Station are not considered significant.

Addition of gas cooling facilities to the Dover Compressor Station would add an additional source of operating noise. Table 3.11.2-2 summarizes the expected increases in noise levels near the Dover Compressor Station.

TABLE 3.11.2-2
**Existing and Estimated Noise Levels at the Dover Compressor Station**

| NSA | Distance/ Direction | Existing Noise level ($L_{dn}$)[1] | Estimated Noise Addition of Gas Cooler ($L_{dn}$) | Total Potential Noise Level[1] ($L_{dn}$) | Potential Noise Increase (dBA) |
|---|---|---|---|---|---|
| 1 | 800 feet/South | 53.5 | 50 | 55.1 | 1.6 |
| 2 | 900 feet/East | 53.1 | 47 | 54.1 | .0 |
| 3 | 3500 feet/West | 51.2 | 36 | 51.3 | 1. |

Note 1: calculated

The data summarized in table 3.11.2-2 indicate that modification of the Dover Compressor Station would increase $L_{dn}$ levels at NSA #1 by about 2 dBA compared to existing conditions. $L_{dn}$ levels at NSA #2 would be increased by about 1 dBA compared to existing conditions. Existing $L_{dn}$ levels at NSA #3 would be increased by 1 dBA compared to existing conditions. In all cases, the

incremental $L_{dn}$ level attributable to the Dover Compressor Station would be less than the FERC guideline of 55 dBA. $L_{dn}$ increments attributable to the Dover Compressor Station after the gas cooling modifications would be about 55.1 dBA at NSA #1, 54.1 dBA at NSA #2, and 51.3 dBA at NSA #3.

To ensure that noise emitted from the station does not exceed an $L_{dn}$ of 55 dBA, we **recommend that:**

> **Iroquois should file a noise survey with the Secretary no later than 60 days after placing the Dover Compressor Station in service. If the noise attributable to the modifications at full load exceeds an $L_{dn}$ of 55 dBA at any nearby NSAs, Iroquois should install additional noise controls to meet that level within 1 year of the in-service date. Iroquois should confirm compliance with the $L_{dn}$ of 55 dBA requirement by filing a second noise survey with the Secretary no later than 60 days after it installs the additional noise controls.**

The proposed modifications to the Brookfield Compressor Station would not significantly alter the construction schedule for that currently planned facility. The proposed modifications to the Brookfield Compressor Station would not require much change in the extent of construction equipment activity that would otherwise occur during facility construction. Consequently, noise impacts from construction of the proposed modifications at the Brookfield Compressor Station are not considered significant.

Modifications proposed for the Brookfield Compressor Station would not alter the operational noise levels generated by that facility.

To ensure that noise emitted from the station does not exceed an $L_{dn}$ of 55 dBA, we **recommend that:**

> **Iroquois should file a noise survey with the Secretary no later than 60 days after placing the authorized unit at the Brookfield Compressor Station in service. If the noise attributable to the operation of the unit at full load exceeds an $L_{dn}$ of 55 dBA at any nearby NSAs, Iroquois should install additional noise controls to meet that level within 1 year of the in-service date. Iroquois should confirm compliance with the $L_{dn}$ of 55 dBA requirement by filing a second noise survey with the Secretary no later than 60 days after it installs the additional noise controls.**

The meter station proposed for this project would be located on the south side of the Long Island Expressway. Other proposed aboveground facilities would be located in areas of open space and forested land use. Consequently, no significant noise impacts would be attributable to these facilities.

Pipeline construction would cause temporary increases in local noise levels due to equipment operation and pipeline testing activities. The noisiest stages of construction activity would be clearing and trenching of the pipeline corridor, and later backfilling of the pipeline trench. In between, assembly, inspection, and installation of the pipeline should generate lower noise levels.

The noisiest stages of construction activity would typically last no more than a week at any given location.

During the noisier stages of construction, average construction activity noise levels would probably exceed 70 dBA for locations within 300 feet of the construction site, and would be about 80 dBA for locations 100 feet from the active construction area. Construction activity noise levels should drop below 60 dBA at distances of 800 feet or more. Most of the onshore pipeline corridor is located in open space, forest, and roadway ROW areas. There are seven residential buildings within 50 feet of the pipeline construction work areas in Long Island. Pipeline construction would result in short periods of high daytime noise levels at these properties. Because of the short duration of construction activities at any one location and because construction plans would be coordinated with individual property owners, pipeline construction noise impacts are not considered significant.

## 3.12 RELIABILITY AND SAFETY

The transportation of natural gas by pipeline involves some risk to the public in the event of an accident and subsequent release of gas. The greatest hazard is a fire or explosion following a major pipeline rupture.

Methane, the primary component of natural gas, is colorless, odorless, and tasteless. It is not toxic, but is classified as a simple asphyxiate, possessing a slight inhalation hazard. If breathed in high concentration, oxygen deficiency can result in serious injury or death. Mercaptan is added to natural gas for safety so that it can be detected by smell.

Methane has an ignition temperature of 1,000 degrees Fahrenheit and is flammable at concentrations between 5.0 percent and 15.0 percent in air. Unconfined mixtures of methane in air are not explosive. However, a flammable concentration within an enclosed space in the presence of an ignition source can explode. It is buoyant at atmospheric temperatures and disperses rapidly in air.

### 3.12.1 Safety Standards

The DOT is mandated to provide pipeline safety under Title 49, USC Chapter 601. The Research and Special Programs Administration's Office of Pipeline Safety administers the national regulatory program to ensure the safe transportation of natural gas and other hazardous materials by pipeline. It develops safety regulations and other approaches to risk management that ensure safety in the design, construction, testing, operation, maintenance, and emergency response of pipeline facilities. Many of the regulations are written as performance standards which set the level of safety to be attained and allow the pipeline operator to use various technologies to achieve safety. Research and Special Programs Administration ensures that people and the environment are protected from the risk of pipeline incidents. This work is shared with state agency partners and others at the Federal, state, and local level. Section 5(a) of the Natural Gas Pipeline Safety Act provides for a state agency to assume all aspects of the safety program for intrastate facilities by adopting and enforcing the Federal standards, while section 5(b) permits a state agency that does not qualify under section 5(a) to perform certain inspection and monitoring functions. A state may also act as DOT's agent to inspect interstate facilities within its boundaries; however, the DOT is responsible for enforcement action. The majority of the states have either 5(a) certifications or 5(b) agreements, while nine states act as interstate agents.

The DOT pipeline standards are published in Parts 190-199 of Title 49 of the CFR. Part 192 of 49 CFR specifically addresses natural gas pipeline safety issues. It does not, however, address other issues like siting and routing, bond issues, etc. These items, in part, are a matter of private negotiation between pipeline companies, landowners, and/or local government zoning boards. The Federal statutes which govern DOT's authority do not authorize DOT to regulate those activities. The FERC takes the Federal lead on issues regarding environmental impacts (which often affect siting and routing), financing, tariffs, etc.

Under a Memorandum of Understanding on Natural Gas Transportation Facilities (Memorandum) dated January 15, 1993 between the DOT and the FERC, the DOT has the exclusive authority to promulgate Federal safety standards used in the transportation of natural gas. Section

157.14(a)(9)(vi) of the FERC's regulations require that an applicant certify that it will design, install, inspect, test, construct, operate, replace, and maintain the facility for which a certificate is requested in accordance with Federal safety standards and plans for maintenance and inspection, or shall certify that it has been granted a waiver of the requirements of the safety standards by the DOT in accordance with section 3(e) of the Natural Gas Pipeline Safety Act. The FERC accepts this certification and does not impose additional safety standards other than the DOT standards. If the Commission becomes aware of an existing or potential safety problem, there is a provision in the Memorandum to promptly alert DOT. The Memorandum also provides for referring complaints and inquiries made by state and local governments and the general public involving safety matters related to pipeline under the Commission's jurisdiction.

The FERC also participates as a member of the DOT's Technical Pipeline Safety Standards Committee which determines if proposed safety regulations are reasonable, feasible, and practicable.

The pipeline and aboveground facilities associated with the Eastern Long Island Extension Project must be designed, constructed, operated, and maintained in accordance with the DOT Minimum Federal Safety Standards in 49 CFR Part 192. The regulations are intended to ensure adequate protection for the public and to prevent natural gas facility accidents and failures. Part 192 specifies material selection and qualification, minimum design requirements, and protection from internal, external, and atmospheric corrosion.

Pipelines are built in areas of varying population density throughout the United States. Because avoidance of populated areas is not always possible, the standards in the Federal regulations become more stringent as the human population density increases.

Part 192 also defines area classifications, based on population density in the vicinity of the pipeline, and specifies more rigorous safety requirements for populated areas. The class location unit is an area that extends 220 yards on either side of the centerline of any continuous one mile length of pipeline. The four area classifications are defined as follows:

Class 1: Location with 10 or fewer buildings intended for human occupancy.

Class 2: Location with more than 10 but less than 46 buildings intended for human occupancy.

Class 3: Location with 46 or more buildings intended for human occupancy or where the pipeline lies within 100 yards of any building, or small well-defined outside area occupied by 20 or more people during normal use.

Class 4: Location where buildings with four or more stories aboveground are prevalent.

Class locations representing more populated areas require higher safety factors in pipeline design, testing, and operation. Pipelines constructed on land in Class 1 locations must be installed with a minimum depth of cover of 30 inches in normal soil and 18 inches in consolidated rock. All pipelines installed in navigable rivers, streams, and harbors must have a minimum cover of 48 inches in soil or 24 inches in consolidated rock. Offshore pipelines constructed in less than 12 feet of water,

as measured from the mean low tide, must have a minimum cover of 36 inches in soil and 18 inches in consolidated rock. Offshore pipelines constructed in 12 to 200 feet of water, as measured from the mean low tide, must be installed so that the top of the pipe is below the natural bottom unless the pipeline is protected by some other means such as a heavy concrete coating.

Class 2, 3, and 4 locations, as well as drainage ditches of public roads and railroad crossings, require a minimum cover of 36 inches in normal soil and 24 inches in consolidated rock. Class locations also specify the maximum distance to a sectionalizing block valve (e.g., 10.0 miles in Class 1, 7.5 miles in Class 2, 4.0 miles in Class 3, and 2.5 miles in Class 4). Pipe wall thickness and pipeline design pressures, hydrostatic test pressures, maximum allowable operating pressure, inspection and testing of welds, and frequency of pipeline patrols and leak surveys must also conform to higher standards in more populated areas. Table 3.12.1-1 provides the DOT class locations by milepost for the proposed Eastern Long Island Extension Project.

TABLE 3.12.1-1
**ELI Project DOT Class Locations**

| Beginning Milepost | End Milepost | Class | Description |
|---|---|---|---|
| 0.0 | 17.1 | 1 | Offshore-Long Island Sound |
| 17.1 | 17.7 | 1 | Onshore Shoreham Plant |
| 17.7 | 19.0 | 2 | Defense Hill & Shoreham Plant |
| 19.0 | 23.4 | 3 | William Floyd Parkway |
| 23.4 | 24.1 | 2 | William Floyd Parkway |
| 24.1 | 24.3 | 1 | William Floyd Parkway |
| 24.3 | 26.2 | 2 | William Floyd Parkway |
| 26.2 | 29.1 | 1 | Long Island Expressway |

Bruno Ricci has indicated that the proposed Devon Compressor Station would be 2,500 feet from a middle school and high school complex, and 1,000 feet from a youth camp. He has also raised several concerns regarding the close proximity of the Brookfield Compressor Station to the Whisconier Middle School, a public school for students in grades 5-8. He has indicated that the Brookfield Compressor Station abuts the Whisconier Middle School property and the modifications to this compressor station would be located approximately 1,800 feet from school property.

Based upon a review of Iroquois' filed information, site visits by our staff, and subsequent analysis, we believe that the safety measures that Iroquois has proposed for the proposed Devon Compressor Station and the Brookfield Compressor Station reconfiguration have adequately addressed safety concerns.

Part 192 prescribes the minimum standards for operating and maintaining pipeline facilities, including the requirement to establish a written plan governing these activities. Under section 192.615, each pipeline operator must also establish an emergency plan that includes procedures to minimize the hazards in a natural gas pipeline emergency. Key elements of the plan include procedures for:

Receiving, identifying, and classifying emergency events, gas leakage, fires, explosions, and natural disasters;

Establishing and maintaining communications with local fire, police, and public officials, and coordinating emergency response;

Emergency shutdown of system and safe restoration of service;

Making personnel, equipment, tools, and materials available at the scene of an emergency; and

Protecting people first and then property, and making them safe from actual or potential hazards.

Part 192 requires that each operator must establish and maintain liaison with appropriate fire, police, and public officials to learn the resources and responsibilities of each organization that may respond to a natural gas pipeline emergency, and to coordinate mutual assistance. The operator must also establish a continuing education program to enable customers, the public, government officials, and those engaged in excavation activities to recognize a gas pipeline emergency and report it to appropriate public officials. Iroquois would provide the appropriate training to local emergency service personnel before the pipeline is placed in service. No additional specialized local fire protection equipment would be required to handle pipeline emergencies.

During the construction process Iroquois anticipates that, to the greatest extent possible, nondestructive testing would be performed on all welds. This is in excess of the requirements set forth in Part 192.

### 3.12.2 Pipeline Accident Data

Since February 9, 1970, 49 CFR Part 191 has required all operators of transmission and gathering systems to notify the DOT of any reportable incident and to submit a report on form F7100.2 within 20 days. Reportable incidents are defined as any leaks that:

Caused a death or personal injury requiring hospitalization;

Required taking any segment of transmission line out of service;

Resulted in gas ignition;

Caused estimated damage to the property of the operator, or others, or both, of a total of $5,000 or more;

Required immediate repair on a transmission line;

Occurred while testing with gas or another medium; or

In the judgment of the operator was significant, even though it did not meet the above criteria.

The DOT changed reporting requirements after June 1984 to reduce the amount of data collected. Since that date, operators must only report incidents that involve property damage of more than $50,000, injury, death, release of gas, or that are otherwise considered significant by the operator. Table 3.12.2-1 presents a summary of incident data for the 1970 to 1984 period, as well as more recent incident data for 1991 through 2000, recognizing the difference in reporting requirements. The 14.5-year period from 1970 through June 1984, which provides a larger universe of data and more basic report information than subsequent years, has been subject to detailed analysis, as discussed in the following sections. [1/]

During the 14.5-year period, 5,862 service incidents were reported over the more than 300,000 total miles of natural gas transmission and gathering systems nationwide. Service incidents, defined as failures that occur during pipeline operation, have remained fairly constant over this period with no clear upward or downward trend in annual totals. In addition, 2,013 test failures were reported. Correction of test failures removed defects from the pipeline before operation.

Additional insight into the nature of service incidents may be found by examining the primary factors that caused the failures. Table 3.12.2-1 provides a percentage distribution of the causal factors as well as the annual frequency of each factor per 1,000 miles of pipeline in service.

The dominant incident cause is outside forces, constituting 53.5 percent of all service incidents from 1970 through June 1984. Outside force incidents result from the encroachment of mechanical equipment such as bulldozers and backhoes; earth movements due to soil settlement, washouts, or geologic hazards; weather effects such as winds, storms, and thermal strains; and willful damage.

During the scoping meetings a commentor voiced concern over the consequences of a dropped anchor over the pipeline. The Iroquois offshore pipeline would be protected with steel reinforced concrete coating. The potential effects of vessel anchors on the Long Island Sound section of the pipeline have been studied, the results show that anchors can not damage the pipeline, due in part, to the diameter of the line, the pipeline wall thickness, and the concrete outer coating of the pipeline.

Table 3.12.2-2 shows that human error in equipment usage was responsible for approximately 75 percent of outside forces incidents. Since April 1982, operators have been required to participate in "One Call" public utility programs in populated areas to minimize unauthorized excavation activities in the vicinity of pipelines. The "One Call" program is a service used by public utilities and some private sector companies (e.g., oil pipelines and cable television) to provide preconstruction information to contractors or other maintenance workers on the underground location of pipes, cables, and culverts. Data from 1991 through 2000 show that the portion of incidents caused by outside forces has decreased to 39.3 percent.

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1/ Jones, D.J., G.S. Kramer, D.N. Gideon, and R.J. Eiber, 1986. "An Analysis of Reportable Incidents for Natural Gas Transportation and Gathering Lines 1970 Through June 1984." NG-18 Report No. 158, Pipeline Research Committee of the American Gas Association.

TABLE 3.12.2-1
**Natural Gas Service Incidents by Cause**

| Cause | Incidents per 1,000 Miles of Pipeline (percentage) 1970-1984 | 1991-2000 |
|---|---|---|
| Outside force | 0.70 (53.5) | 0.10 (39.3) |
| Corrosion | 0.22 (16.6) | 0.06 (23.25) |
| Construction or material defect | 0.27 (21.7 ) | 0.03 (12.7) |
| Other | 0.11 ( 8.2) | 0.06 (24.2) |
| **TOTAL** | **1.30** | **0.25** |

TABLE 3.12.2-2
**Outside Forces Incidents by Cause (1970-1984)**

| Cause | Percent |
|---|---|
| Equipment operated by outside party | 67.1 |
| Equipment operated by or for operator | 7.3 |
| Earth movement | 13.3 |
| Weather | 10.8 |
| Other | 1.5 |

The pipelines included in the data set in table 3.12.2-1 vary widely in terms of age, pipe diameter, and level of corrosion control. Each variable influences the incident frequency that may be expected for a specific segment of pipeline.

The frequency of service incidents is strongly dependent on pipeline age. While pipelines installed since 1950 exhibit a fairly constant level of service incident frequency, pipelines installed before that time have a significantly higher rate, partially due to corrosion. Older pipelines have a higher frequency of corrosion incidents, since corrosion is a time-dependent process. Further, new pipe generally uses more advanced coatings and cathodic protection to reduce corrosion potential.

Older pipelines have a higher frequency of outside forces incidents partly because their location may be less well known and less well marked than newer lines. In addition, the older pipelines contain a disproportionate number of smaller diameter pipelines, which have a greater rate of outside forces incidents. Small diameter pipelines are more easily crushed or broken by mechanical equipment or earth movements.

TABLE 3.12.2-3
**External Corrosion by Level of Control (1970-1984)**

| Corrosion Control | Incidents per 1,000 miles per Year |
|---|---|
| None-bare pipe | 0.42 |
| Cathodic protection only | 0.97 |
| Coated only | 0.40 |
| Coated and cathodic protection | 0.11 |

DOT Minimum Federal Safety Standards in 49 CFR Part 192 only requires that the pipe be coated, it does not specify the coating performance characteristics. Iroquois would ensure that the pipe coating would be factory applied fusion-bonded epoxy (FBE) to twice the industry standard thickness to help eliminate risks to external corrosion. FBE is a high integrity coating that is resistant to soil stresses and does not shield the pipe from the catholic protection system. Over time, it has been shown to be one of the most reliable coating systems for onshore pipelines available.

Concern about potential environmental impacts in Long Island Sound resulting from cathodic protection systems similar to those that have been reported from the electromagnetic fields (EMF) generated by electric transmission lines, have been raised. We are not aware of, nor anticipate, any health hazards from the low-power, direct current output of cathodic systems. We are aware of media reports regarding the health effects of EMF which relate to alternating-current power transmission systems, not direct-current systems. Electric power transmission lines transmit alternating current. The transmission of alternating current generates fluctuating EMF. Direct-current systems do not generate fluctuating EMF. Also, the elements (ground beds and rectifiers) of the cathodic protection system would be designed and located to control the cathodic protection direct-current so that the effect on any other buried metallic structures and the marine environment would be negligible.

### 3.12.3 Impact on Public Safety

The service incident data summarized in table 3.12.2-1 include pipeline failures of all magnitudes with widely varying consequences. Approximately two-thirds of the incidents were classified as leaks, and the remaining third classified as ruptures, implying a more serious failure. Fatalities or injuries occurred in 4 percent of the service incidents reported in the 14.5-year period from 1970 through June 1984.

Table 3.12.3-1 presents the average annual fatalities that occurred on natural gas transmission and gathering lines from 1970 to 2000. Fatalities between 1970 and June 1984 have been separated into employees and nonemployees, to better identify a fatality rate experienced by the general public. Of the total 5.0 nationwide average, fatalities among the public averaged 2.6 per year over this period. The simplified reporting requirements in effect after June 1984 do not differentiate between employees and nonemployees. However, the data show that the total annual average for the period 1984 through 2000 decreased to 4.2 fatalities per year. Subtracting two major offshore incidents in 1989, which do not reflect the risk to the onshore public, yields a total annual rate of 3.1 fatalities per year for this period.

TABLE 3.12.3-1

**Annual Average Fatalities - Natural Gas Transmission and Gathering Systems** [a/, b/]

| Year | Employees | Nonemployees | Total |
|---|---|---|---|
| 1970-June 1984 | 2.4 | 2.6 | 5.0 |
| 1984-2000 [c/] | - | - | 4.2 |
| 1984-2000 [c/] | - | - | 3.1 [d/] |

a/ 1970 through June 1984 - American Gas Association, 1986.
b/ DOT Hazardous Materials Information System.
c/ Employee/nonemployee breakdown not available after June 1984.
d/ Without 18 offshore fatalities occurring in 1989 -- 11 fatalities resulted from a fishing vessel striking an offshore pipeline and 7 fatalities resulted from explosion on an offshore production platform.

The nationwide totals of accidental fatalities from various man-made and natural hazards are listed in table 3.12.3-2 in order to provide a relative measure of the industry-wide safety of natural gas pipelines. Direct comparisons between accident categories should be made cautiously, since individual exposures to hazards are not uniform among all categories. Nevertheless, the average 3.1 public fatalities per year is relatively small considering the more than 300,000 miles of transmission and gathering lines in service nationwide. Furthermore, the fatality rate is approximately two orders of magnitude (100 times) lower than the fatalities from natural hazards such as lightning, tornados, floods, earthquakes, etc.

The available data show that natural gas pipelines continue to be a safe, reliable means of energy transportation. Based on approximately 311,000 miles in service, the rate of public fatalities for the nationwide mix of transmission and gathering lines in service is 0.01 per year per 1,000 miles of pipeline. Using this rate, the Eastern Long Island Extension Project would result in a public fatality about every 3,818 years. Considering that 17 miles of the total 29.1 miles of the pipeline is located offshore, the onshore portion alone might result in a fatality every 9,295 years. This would represent a slight increase in risk to the nearby public.

TABLE 3.12.3-2
**Nationwide Accidental Deaths** [a/]

| Type of Accident | Fatalities |
|---|---|
| All accidents | 90,523 |
| Motor vehicles | 43,649 |
| Falls | 14,985 |
| Drowning | 3,488 |
| Poisoning | 9,510 |
| Fires and burns | 3,791 |
| Suffocation by ingested object | 3,206 |
| Tornado, flood, earthquake, etc. (1984-93 average) | 181 |
| All liquid and gas pipelines (1978-87 average) [b/] | 27 |
| Gas transmission and gathering lines Nonemployees only (1970-84 average) [c/] | 2.6 |

a/ All data, unless otherwise noted, reflects 1996 statistics from the U.S. Department of Commerce, Bureau of the Census, "Statistical Abstract of the United States 118th Edition."
b/ U.S. Department of Transportation, "Annual Report on Pipeline Safety - Calendar Year 1987."
c/ American Gas Association, 1986.